

CLAIMS

1. A plant for vacuum metallization of objects treated in batches, comprising: a vacuum chamber; at least one part-carrying system (15) movable inside said vacuum chamber; at least one discharge electrode (5B); at least one diffuser (5A) associated with said discharge electrode for introduction of at least one fluid substance; characterized in that the discharge electrode (5B) and the diffuser (5A) are associated with at least one housing arranged inside said vacuum chamber, in an approximately central position, said housing containing at least partly said discharge electrode and/or said at least one diffuser.

2. Plant according to Claim 1, characterized in that said chamber has a longitudinal axis (A-A) and in that said housing (5), said discharge electrode (5B) and said diffuser (5A) are elongated and extend parallel to said longitudinal axis (A-A) of the vacuum chamber.

3. Plant according to Claim 1 or 2, characterized in that said part-carrying system rotates about an axis of rotation (A-A) inside said vacuum chamber.

4. Plant according to Claim 1 or 2 or 3, characterized in that said housing has the form of a substantially semi-cylindrical wall surrounding at least partially said discharge electrode and said diffuser.

5. Plant according to one or more of the preceding claims, characterized in that said housing is arranged inside said part-carrying system (15).

6. Plant according to one or more of the preceding claims, characterized in that it comprises: a fixed body (3) cooperating alternately with one or other of two closing hatches (11A; 11B) so as to define a vacuum chamber; on each of said two hatches a respective part-carrying system (15) movable inside said vacuum chamber when the plant is in operation; on each of said hatches, at least one high-voltage discharge electrode (5B); for each hatch (11A; 11B) at least one diffuser (5A) supported by the respective hatch in the vicinity of the respective at least one discharge electrode; at least one housing (5) for the assembly

consisting of the discharge electrode (5B) and the respective diffuser (5A) being provided on each hatch.

7. Plant according to Claim 5, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) of each hatch are located inside the volume defined by the respective hatch, in the vicinity of the longitudinal axis (A-A) of the vacuum chamber.

8. Plant according to Claim 6 or 7, characterized in that said hatches are hinged with said central body on opposite sides thereof about hinging axes substantially parallel to the axis (A-A) of the vacuum chamber, said axis being substantially vertical.

9. Plant according to one or more of Claims 1 to 5, characterized in that said vacuum chamber has a frontally closing hatch and a substantially horizontal longitudinal axis (A-A) and in that said part-carrying system can be inserted into and extracted from said vacuum chamber.

10. Plant according to Claim 9, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) have a horizontal extension substantially parallel to the axis (A-A) of said vacuum chamber.

11. Plant according to Claim 9 or 10, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) are movable with said part-carrying system so as to be inserted into said chamber and extracted therefrom.

12. Plant according to Claim 9 or 10, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) are mounted on an end of said chamber substantially opposite the hatch for closing thereof.

13. Plant according to one or more of the preceding claims, characterized in that said housing (5) for the assembly consisting of discharge electrode (5B) and diffuser (5A) has the form of an arched surface.

14. Plant according to Claim 13, characterized in that said

housing has a shape of a cylindrical surface.

15. Plant according to Claim 13 or 14, characterized in that the discharge electrode (5B) and the diffuser (5A) are arranged inside the arc defined by the cross section of the housing (5).

5 16. Plant according to Claim 15, characterized in that the discharge electrode (5B) is located in the center of the arc of the respective housing (5) and the diffuser (5A) is located in a radially peripheral zone.

10 17. Plant according to at least Claim 6, characterized in that the vacuum chamber defined by said body and by said closing hatches has a substantially cylindrical shape with a circular cross section.

15 18. Plant according to one or more of the preceding claims, characterized in that said diffuser (5A) has a plurality of calibrated holes distributed along the longitudinal extension of said diffuser (5A) with a diameter increasing from a first end to a second end of said diffuser, the first end of the diffuser being connected to a duct supplying the product to be diffused inside the vacuum chamber and the second end being closed.

20 19. Plant according to one or more of the preceding claims, characterized in that a second diffuser (5C) for the introduction of a substance in the fluid state is associated with said at least one discharge electrode (5B).

25 20. Plant according to Claim 19, characterized in that said at least one diffuser (5A) has the function of introducing a substance for the formation of a protective layer deposited on the parts treated in the vacuum chamber and said second diffuser (5C) has the function of introducing a gas.

21. Plant according to Claim 19 or 20, characterized in that said second diffuser (5C) is enclosed in the volume protected by said housing (5).

30 22. Plant according to at least Claim 6, characterized in that, on each of said hatches (11A; 11B), the discharge electrode (5B), the diffuser (5A) and the housing (5) are located in the vicinity of the edge of the hatch

which in the closed condition cooperates with the edge of the fixed body (3) so as to form and close said vacuum chamber and in that said housing has a convexity directed toward the axis of rotation (A-A) of the carousel (15).

5           23. Plant according to one or more of the preceding claims, characterized in that two or more of said housings (5) with corresponding discharge electrodes (5B) and diffusers (5A; 5C) are arranged inside said vacuum chamber.

10           24. Plant according to one or more of the preceding claims, characterized in that said part-carrying system comprises a carousel rotating about a main axis of rotation (A-A), and a series of part-carrying devices rotating about respective auxiliary axes parallel to the main axis of rotation, the parts thus being imparted a planetary motion inside the vacuum chamber.

CLAIMS

1. A plant for vacuum metallization of objects treated in batches, comprising: a vacuum chamber; at least one part-carrying system (15) movable inside said vacuum chamber; at least one discharge electrode (5B); at least one diffuser (5A) associated with said discharge electrode for introduction of at least one fluid substance; a housing containing at least partly said discharge electrode and/or said at least one diffuser; wherein said discharge electrode (5B) and said diffuser (5A) are elongated and extend parallel to a longitudinal axis (A-A), and said housing is opened parallel to said axis; characterized in that said housing is arranged inside said vacuum chamber, in an approximately central position..
2. Plant according to Claim 1, characterized in that said part-carrying system rotates about an axis of rotation (A-A) inside said vacuum chamber.
3. Plant according to Claim 1 or 2, characterized in that said housing has the form of a substantially semi-cylindrical wall surrounding at least partially said discharge electrode and said diffuser.
4. Plant according to one or more of the preceding claims, characterized in that said housing is arranged inside said part-carrying system (15).
5. Plant according to one or more of the preceding claims, characterized in that it comprises: a fixed body (3) cooperating alternately with one or other of two closing hatches (11A; 11B) so as to define a vacuum chamber; on each of said two hatches a respective part-carrying system (15) movable inside said vacuum chamber when the plant is in operation; on each of said hatches, at least one high-voltage discharge electrode (5B); for each hatch (11A; 11B) at least one diffuser (5A) supported by the respective hatch in the vicinity of the respective at least one discharge electrode; at least one housing (5) for the assembly consisting of the discharge electrode (5B) and the respective diffuser (5A) being provided on each hatch.
6. Plant according to Claim 5, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) of each hatch are located inside the volume defined by the respective hatch, in the vicinity of the longitudinal axis (A-A) of the vacuum chamber.
7. Plant according to Claim 5 or 6, characterized in that said hatches are hinged with said central body on opposite sides thereof about hinging axes

substantially parallel to the axis (A-A) of the vacuum chamber, said axis being substantially vertical.

8. Plant according to one or more of Claims 1 to 4, characterized in that said vacuum chamber has a frontally closing hatch and a substantially horizontal longitudinal axis (A-A) and in that said part-carrying system can be inserted into and extracted from said vacuum chamber.

9. Plant according to Claim 8, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) have a horizontal extension substantially parallel to the axis (A-A) of said vacuum chamber.

10. Plant according to Claim 8 or 9, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) are movable with said part-carrying system so as to be inserted into said chamber and extracted therefrom.

11. Plant according to Claim 8 or 9, characterized in that said housing (5), said discharge electrode (5B) and said diffuser (5A) are mounted on an end of said chamber substantially opposite the hatch for closing thereof.

12. Plant according to one or more of the preceding claims, characterized in that said housing (5) for the assembly consisting of discharge electrode (5B) and diffuser (5A) has the form of an arched surface.

13. Plant according to Claim 12, characterized in that said housing has a shape of a cylindrical surface.

14. Plant according to Claim 12 or 13, characterized in that the discharge electrode (5B) and the diffuser (5A) are arranged inside the arc defined by the cross section of the housing (5).

15. Plant according to Claim 14, characterized in that the discharge electrode (5B) is located in the center of the arc of the respective housing (5) and the diffuser (5A) is located in a radially peripheral zone.

16. Plant according to at least Claim 5, characterized in that the vacuum chamber defined by said body and by said closing hatches has a substantially cylindrical shape with a circular cross section.

17. Plant according to one or more of the preceding claims, characterized in that said diffuser (5A) has a plurality of calibrated holes distributed along the longitudinal extension of said diffuser (5A) with a diameter increasing from a first end to a second end of said diffuser, the first end of the diffuser being connected to a duct supplying the product to be diffused inside

the vacuum chamber and the second end being closed.

18. Plant according to one or more of the preceding claims, characterized in that a second diffuser (5C) for the introduction of a substance in the fluid state is associated with said at least one discharge electrode (5B).

19. Plant according to Claim 18, characterized in that said at least one diffuser (5A) has the function of introducing a substance for the formation of a protective layer deposited on the parts treated in the vacuum chamber and said second diffuser (5C) has the function of introducing a gas.

20. Plant according to Claim 18 or 19, characterized in that said second diffuser (5C) is enclosed in the volume protected by said housing (5).

21. Plant according to at least Claim 5, characterized in that, on each of said hatches (11A; 11B), the discharge electrode (5B), the diffuser (5A) and the housing (5) are located in the vicinity of the edge of the hatch which in the closed condition cooperates with the edge of the fixed body (3) so as to form and close said vacuum chamber and in that said housing has a convexity directed toward the axis of rotation (A-A) of the carousel (15).

22. Plant according to one or more of the preceding claims, characterized in that two or more of said housings (5) with corresponding discharge electrodes (5B) and diffusers (5A; 5C) are arranged inside said vacuum chamber.

23. Plant according to one or more of the preceding claims, characterized in that said part-carrying system comprises a carousel rotating about a main axis of rotation (A-A), and a series of part-carrying devices rotating about respective auxiliary axes parallel to the main axis of rotation, the parts thus being imparted a planetary motion inside the vacuum chamber.